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**Datasheet for the decision
of 13 March 2008**

Case Number: T 1810/06 - 3.2.01

Application Number: 03012099.2

Publication Number: 1366936

IPC: B60H 1/00

Language of the proceedings: EN

Title of invention:

Device and method for automatically preventing misting of the
windscreen of a vehicle

Applicant:

C.R.F. SOCIETÀ CONSORTILE PER AZIONI

Opponent:

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Headword:

-

Relevant legal provisions:

RPBA Art. 13(1), 15(3)

Relevant legal provisions (EPC 1973):

EPC Art. 56, 84

Keyword:

-

Decisions cited:

T 0917/95

Catchword:

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Case Number: T 1810/06 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 13 March 2008

Appellant: C.R.F. SOCIETÀ CONSORTILE PER AZIONI
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 14 August 2006
refusing European application No. 03012099.2
pursuant to Article 97(1) EPC 1973.

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
S. Hoffmann

Summary of Facts and Submissions

- I. The appeal is directed against the decision posted 14 August 2006 refusing European patent application No. 03 01 2099.2 (EP-A-1 366 936).
- II. The following state of the art played a role during the appeal proceedings:

D1: US-A-2001/0032470

D6: US-B-6 202 934.

The examining division had found in a decision according to the state of the file that the subject-matter of claims 1 according to all requests did not involve an inventive step in the light of the disclosures of D1 and D6. In particular, as regards the main request the examining division found that the only features not known from D1 related to the type and positioning of the interior temperature sensing means. It took the view that the type of sensing means was known from D6 and that its position was rendered obvious by which temperature was to be sensed.

- III. With its statement of grounds of appeal the appellant filed amended claims according to a main request and first to third auxiliary requests. The board summoned the appellant to oral proceedings and indicated its provisional opinion that claims according to all requests were unclear and contained subject-matter which had not been originally disclosed. As regards inventive step of the subject-matter of claim 1 according to the main request the board indicated its

opinion that it seemed that the only technical problem solved by the use of a particular form of sensor, which in itself was well known, arranged at a particular place and orientation was to put the general teaching of D1 into practical effect. It indicated that it would therefore have to be considered at the oral proceedings whether the choice of sensor and its position and orientation were obvious for the person skilled in the art. The board further indicated its provisional opinion that additional features in claims 1 according to the auxiliary requests would fail to establish an inventive step.

IV. With a letter of 13 February 2008 the appellant filed amended sets of claims and requested that a patent be granted on the basis of the claims according to the main request or first to third auxiliary requests filed therewith, and in each case on the description and drawings "in the present form". It withdrew its request for oral proceedings and requested a decision according to the state of the file, referring to the Guidelines for Examination E-X 4.4.

V. The oral proceedings took place on 13 March 2008. The appellant did not attend.

VI. Claim 1 according to the main request reads:

"A device (1) for preventing misting of a windscreen (2) of a vehicle (1) having a passenger compartment (5), comprising:

- sensor means (4, 6, 7) configured to detect ambient conditions capable of misting the windscreen (2);
and

- intervention means (8, 9) activable automatically when the ambient conditions occur to prevent misting of the windscreen (2);

characterized in that the sensor means (4, 6, 7) comprise:

- radiant mean temperature sensor means (4) arranged inside the passenger compartment (5), facing the windscreen (2), to measure a temperature (T_i) inside the passenger compartment (5);
- external temperature sensor means (6) configured to measure a temperature (T_e) outside the vehicle (3); and
- humidity sensor means (7) configured to measure a humidity (UR) inside the passenger compartment (5);

and in that the intervention means (9, 9) comprise:

- computing means (20, 30) configured to compute a temperature (T_v) of the windscreen (2) as a function of the temperature (T_i) inside the passenger compartment (5) and the temperature (T_e) outside the vehicle (3), and a dew point temperature (T_r) as a function of the temperature (T_i) and humidity (UR) inside the passenger compartment (5)); and
- comparing means (40) configured to compare the temperature (T_v) of the windscreen (2) with the dew point temperature (T_r), and to activate the intervention means (8, 9) when a predetermined relationship exists between the temperature of the windscreen (T_v) and the dew point temperature (T_r).

Claim 1 according to the first auxiliary request differs from that of the main request in that the radiant mean temperature sensor means is "arranged on an inner face of a roof (8) of the vehicle" and facing the windscreen.

Claim 1 according to the second auxiliary request differs from that of the main request *inter alia* in that the computing means are configured to compute the temperature (T_v) of the windscreen according to:

$$C_v \frac{dT_v}{d\tau} = \alpha_i \cdot A_1 \cdot (T_i - T_v) - \frac{\alpha_e \cdot \lambda \cdot \lambda_{pvb}}{\alpha_e \cdot [\lambda_{pvb} \cdot (s_1 + s_3) + \lambda \cdot s_2] + \lambda \cdot \lambda_{pvb}} \cdot A_1 \cdot (T_v - T_e)$$

where:

C_v = windscreen heat capacity [J/K]

T_v = windscreen temperature [°C]

A₁ = windscreen area [m²]

T_i = passenger compartment temperature [°C]

T_e = external temperature [°C]

α_i = internal convective heat exchange coefficient [W/(m².K)]

α_e = external convective heat exchange coefficient [w/(m².K)]

s₁ = inner glass thickness [m]

s₂ = pvb layer thickness [m]

s₃ = outer glass thickness [m]

λ = glass thermal conductivity [W(m.K)]

λ_{pvb} = pvb thermal conductivity [W(m.K)] "

Claim 1 according to the third auxiliary request is effectively a combination of claims 1 according to the first and second auxiliary requests.

VII. The appellants' written submissions may be summarised as follows:

In respect of the main request, whereas claim 1 specifies using a sensor to measure the interior temperature and then calculate the temperature of the

inner surface of the windscreen, D6 teaches measuring this inner surface temperature directly.

As regards the first auxiliary request, whereas claim 1 specifies that the temperature sensor be arranged on the inner surface of the roof, according to D6 the sensor for measuring the temperature of the inner surface of the windscreen is mounted on the top part of the instrument panel. As a result, the field of view of the D6 sensor is not in the area most affected by misting. The subject-matter of the claim therefore solves the problem of improving reliability, effectiveness and timeliness of prevention of windscreen misting.

As regards the second and third auxiliary requests, the additional feature of the particular formula used to calculate the temperature of the interior surface of the windscreen was not disclosed in the cited state of the art.

Reasons for the Decision

1. Conventionally, a vehicle operator reacts to the formation of mist on the interior surface of a windscreen by attempting to remove it once it has formed. This application relates to a device for automatically preventing the misting by sensing conditions which are favourable to the mist forming and acting to prevent it from happening.

Main request

2. The closest state of the art is known from D1 which also relates to a device which detects a risk of misting of the interior surface of the windscreen of a vehicle having a passenger compartment and which automatically operates means to prevent misting of the windscreen from occurring. In accordance with the teaching of D1 the average temperature in the passenger compartment is measured (paragraph [0067]), external temperature sensor means measure a temperature outside of the vehicle (paragraph [0104]) and humidity sensor means measure a humidity inside the passenger compartment (paragraph [0080], first sentence). Computing means are provided to calculate a temperature of the windscreen as a function of "an average temperature inside the passenger compartment" and the temperature outside the vehicle ([paragraphs [0022], [0086]]. Computing means also calculate a dew point temperature as a function of the temperature and humidity inside the passenger compartment (paragraph [0085]). Means compare the temperature of the windscreen with the dew point temperature and when a predetermined relationship exists between the temperature of the windscreen and the dew point temperature they activate heating, ventilating and air-conditioning means to prevent misting from occurring (paragraph [0108]).

2.1 The subject-matter of present claim 1 differs from the disclosure of D1 in that an average temperature in the passenger compartment is measured by a radiant mean temperature sensor means arranged inside the passenger compartment, facing the windscreen. D1 does not give a detailed teaching as regards the interior temperature sensor but merely speaks of "a sensor in the passenger

compartment, known per se." The differentiating features therefore solve the problem of putting the teaching of D1 into practical effect.

2.1.1 The board indicated when summoning the appellant to oral proceedings that it considered a radiant mean temperature sensor to be known *per se* and the appellant has not contradicted that view. Moreover, D6 shows not only that a radiant mean temperature sensor means is known, although it is there termed a surface temperature sensor, but also that it may be employed for the same purpose of measuring temperature in the interior of a vehicle, see column 10, lines 37 to 46. D6 relates generally to the operation of automatic air conditioning in a vehicle so is relevant background art to this application and may serve as a source of features which are not disclosed in detail in D1.

2.1.2 D1 merely refers to measurement of "an average" temperature in the passenger compartment. This parameter is used in D1 in a calculation of the temperature of the interior surface of the windscreen. The skilled person will be aware that temperature gradients will exist in the vehicle interior and that the calculation will be most accurate if based on an average temperature in the proximity of the windscreen, see D1 figure 5. For the skilled person having chosen to use a radiant mean temperature sensor means this would require directing it to face the windscreen.

2.2 It follows from the foregoing that the differentiating features are no more than the application of a known sensor in a way which follows logically from the teaching of D1.

2.3 Although according to D6 a radiant mean temperature sensing means measures the temperature of the inner surface of the windscreen directly, that measurement is for a purpose which is not directly relevant to the skilled person wishing to complete the teaching of D1. The skilled person following the disclosure of D1 is merely looking for a known temperature sensor which may be used for measuring the interior temperature in order to perform the calculation disclosed in D1 and finds a suitable sensor in D6.

2.4 The subject-matter of present claim 1 therefore does not involve an inventive step.

3. The appellant requested grant of the patent also on the basis of the description "in the present form". That form includes the presently claimed embodiment using a radiant mean temperature sensor means to measure interior temperature but in the penultimate paragraph of the description, on page 8 as originally filed, it is stated that "internal ... temperature may be determined otherwise than as described, e.g. indirectly from other physical quantities on the vehicle." This is inconsistent with claim 1 which specifies direct measurement of temperature, thereby rendering the claim unclear (Article 84 EPC 1973).

4. On the basis of the foregoing the present request fails.

First auxiliary request

5. Claim 1 according to this request has the additional feature that the temperature sensor means are arranged

on an inner face of the roof of the vehicle. This is merely a practical feature which results from consideration of how the sensor may be incorporated in the vehicle and has no combinative effect with the differentiating features set out under 2.1 above. The skilled person wishing to position a radiant mean surface temperature sensor to face the windscreen would have a limited range of possibilities available to him. One of those which would readily occur to him is to arrange it on the inner face of the vehicle roof. Indeed, that location is already known for arranging radiant mean surface temperature sensors, see D6 figures 10, 16.

- 5.1 The board cannot accept the appellant's arguments concerning either the benefits of the temperature sensor as presently claimed in comparison with that in D6 or the problem to be solved. The specification in present claim 1 that the temperature sensor is arranged in an unspecified location on the inner surface of the roof and "facing" the windscreen is vague as regards both the proportion of the sensor's field of view occupied by the windscreen and also which part of the windscreen falls within that field of view. The disclosures of D1 and D6, whilst being in the same technical field of vehicle ventilation and air-conditioning systems, are directed towards different aspects of their performance and the skilled person seeking to implement automatic avoidance of the misting of a windscreen in accordance with D1 would adopt a sensor location and orientation appropriate to that purpose. There is also no foundation for the appellant's assertion that the problem to be solved when beginning from the disclosure of D1 is improving

reliability, effectiveness and timeliness of prevention of windscreen misting. As already set out above, the novel features of present claim 1 merely complete the somewhat vague disclosure of D1 concerning the sensor for the interior temperature. It follows that there is no basis for the comparison inherent in the appellant's definition of the problem.

- 5.2 The board concludes that the subject-matter of claim 1 according to this request also does not involve an inventive step.
6. The content of point 3 above is equally applicable to this request.
7. For the above reasons this request also fails.

Second and third auxiliary requests

8. The claims 1 according to both of these requests contain the additional feature of the formula for calculating the temperature of the internal surface of the windscreen. This feature was introduced into the claims 1 filed with the letter of 13 February 2008 and had not previously been contained in any claim.
- 8.1 Article 13(1) RPBA (OJ EPO 2007, 537-547) states that "any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject matter submitted, the current state of the proceedings and the need for procedural economy. "

8.2 Some amendments contained in the claims filed with the letter of 13 February 2008 were admissible by virtue of being in response to objections first raised by the board in its communication annexed to the summons to oral proceedings. However, that is not true of the introduction of the presently claimed formula. Moreover, this formula had not previously been claimed so that the board is unable to know whether it had been taken into account during the search. Contrary to the appellant's argument, the absence of the formula from the cited state of the art therefore cannot be used as an indicator of the presence of inventive step.

8.3 The appellant had ample opportunity to file claims 1 according to the present auxiliary requests at the latest with its statement of grounds of appeal if it was interested in obtaining protection for that subject-matter. The board considers it to be an abuse of the procedure to first file such requests in response to a summons to oral proceedings before the board. Exercise of the board's discretion in favour of admitting these requests would require the case to be remitted to the first instance for further examination, thereby causing an unacceptable delay in the procedure, to the detriment of third party interests.

8.4 The board therefore exercises its discretion in accordance with Article 13(1) RPBA and refuses to admit these requests.

Procedural considerations

9. In response to the summons to oral proceedings and accompanying provisional opinion of the board the appellant filed amended sets of claims, withdrew its request for oral proceedings and asked for a decision according to the state of the file, referring to the Guidelines E-X 4.4. As stated in the Guidelines a decision according to the state of the file will merely refer to previous communications for its grounds. However, since in the present case the appellant has, together with its request for a decision according to the state of the file, submitted amended claims no communications had been issued relating to those claims. Under these circumstances a decision according to the state of the file would not have been possible. It is clear from the appellant's actions that what it sought was a final decision without any further involvement on its part. However, despite the appellant's apparent desire to no longer be involved in the proceedings it was entitled to an opportunity to present its comments on any obstacles to grant of a patent in accordance with its requests. Under these circumstances the oral proceedings were the most appropriate means for bringing the case to a conclusion without undue delay.
10. It follows from points 3, 6 above that even if the subject-matter of the respective claims 1 were to have involved an inventive step grant of the patent in accordance with the appellant's requests would not have been possible. As pointed out in decision T 917/95 (not published in OJ EPO) a party who prior to oral proceedings files new claims but no correspondingly adapted description and who is not represented at the oral proceedings cannot rely on the board postponing its final decision at the end of the oral proceedings

in order to afford a further opportunity to adapt the description to the claims. Indeed, such an action by the board would be contrary to the provision of Article 15(3) RPBA.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar:

The Chairman:

A. Vottner

S. Crane